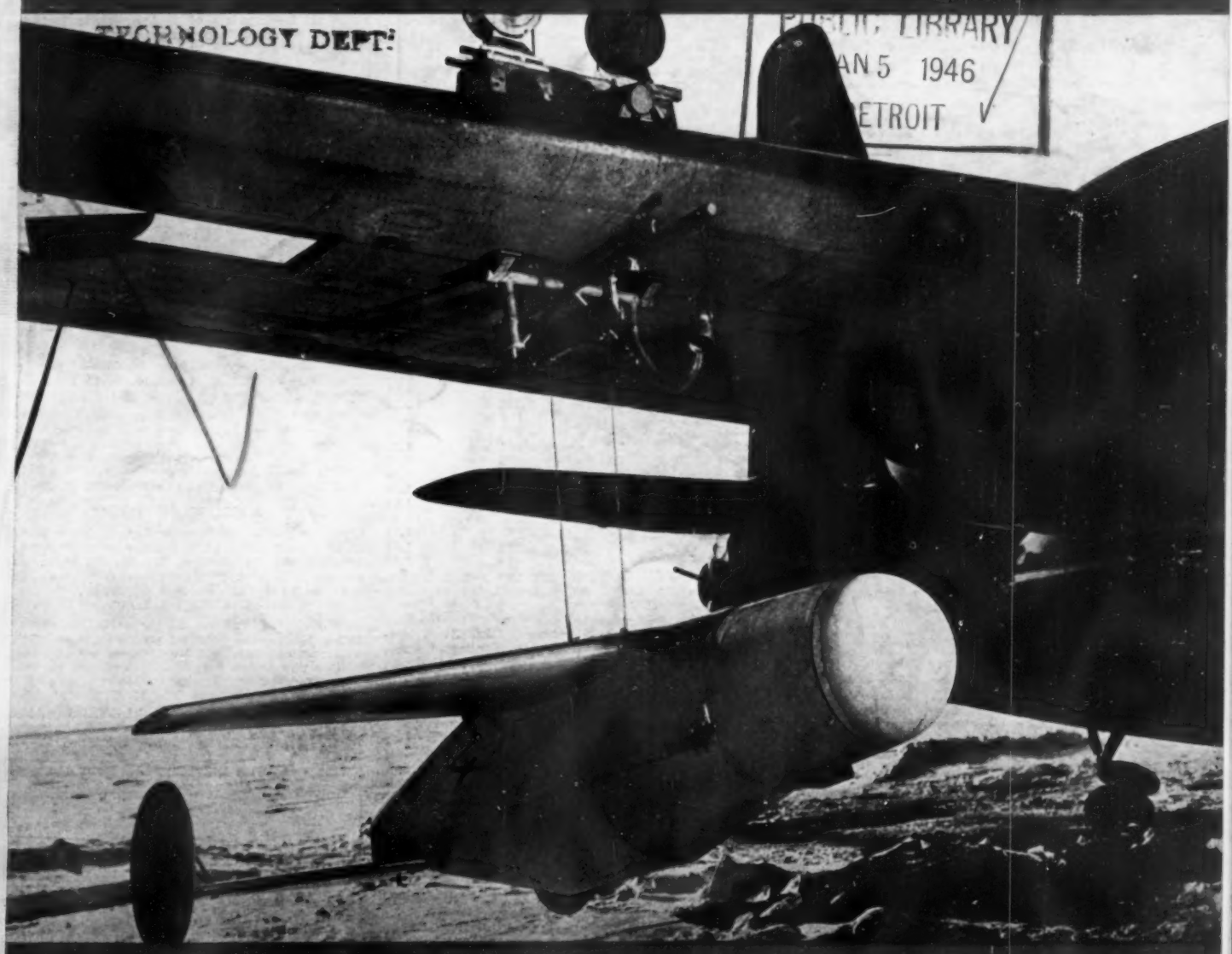
15¢

INDEX

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • DECEMBER 29, 1945

TECHNOLOGY DEPT.
PUBLIC LIBRARY
JAN 5 1946
DETROIT



Self-Guided

See Page 403

A SCIENCE SERVICE PUBLICATION

WAR BARGAINS in LENSES and PRISMS

SILVERED TANK PRISM

Stock No. 3004-Q.....$2.00 each Postpaid

PLAIN TANK PRISM

Stock No. 3005-Q.....$2.00 each Postpaid

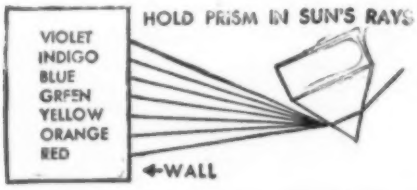
FOUR TANK PRISMS—Special—$7.00 Postpaid

The most sensational bargain we have ever been able to offer.

TANK PRISMS

In order that the tank driver shall not get shot in the face, 2 of these Silvered Prisms are used to make a Periscope. We have secured a number of these that are very slightly chipped, making possible their sale at a very low price. They are 90-45-45 degree Prisms of huge size—5¾" long, 2½" wide, finely ground and polished. Used to build a Periscope . . . excellent also for experiments, classroom demonstrations. Some of our ingenious customers have used these prisms to make camera stereo attachment, range finder, etc. Prism easily converted into desk name plate by affixing gold letters. 100 gold letters supplied at only 10c. (Order Stock No. 3008-Q.) Normally these prisms would retail from $24 to $30 each.

TO SEE THE COLORS OF THE SPECTRUM hold a plain tank prism in sun's rays as shown in drawing. White incident light which passes through prism is thus broken up into a band of primary colors known as the spectrum—a beautiful sight! By looking through a tank prism at a certain angle you can see a world of colors everywhere. Truly amazing!



All items Finely Ground and Polished but Edges Slightly Chipped or Other Slight Imperfections Which We Guarantee Will Not Interfere with Their Use. Come Neatly Packed and Marked.

TO KEEP POSTED on all our new Optical Items, send 10c and your name and address to get on our regular "Flash" mailing list.

REMARKABLE VALUE! $141.01 WORTH OF PERFECT LENSES FOR ONLY $10.00

Complete System from Artillery Scope (5X) . . . 9 Lenses, low reflection coated, ABSOLUTELY PERFECT. Diameters range from 1 1/3 inches to 2 1/5 inches. Used for making Telescope and hundreds of other uses.
Stock #5019-Q ..... $10.00 Postpaid

14-POWER COLOR CORRECTION MAGNIFIER SET—Consists of 2 Achromatic Lenses and section of metal tubing for mount.
Stock #1044-Q.....$1.55 Postpaid

OPTICS FROM 4-POWER PANORAMIC TELESCOPE—Excellent condition. Consists of Objective Prism, Dove Prism, Achromatic Objective Lens, Amici Roof Prism, Eye Lens Set (. . . a $60.00 value)
Stock #5016-Q.....$6.00 Postpaid

ALL THE LENSES YOU NEED TO MAKE YOUR OWN TELESCOPE! ALL ARE ACHROMATIC LENSES

GALILEAN TYPE—Simplest to Make but has Narrow Field of View.

Stock
#5018-Q—4 Power Telescope...$1.25 Postpaid
#5004-Q—Small 2 Power Pocket Scope $1.00 Postpaid

TERRESTRIAL TYPE — Have Much Wider Field of View than Galilean Type.

Stock
#5007-Q—11 Power Telescope $3.20 Postpaid
#5008-Q—20 Power Telescope...$3.45 Postpaid

PRISM TELESCOPES—Uses Prism instead of Lenses to Erect Image and are much shorter than Terrestrial Type. Have wide field of view.

Stock
#5010-Q—6 Power Telescope...$3.00 Postpaid
#5011-Q—11 Power Telescope—$3.25 Postpaid
#5012-Q—20 Power Telescope...$7.25 Postpaid

MICROSCOPE SETS

Consisting of 4 Achromatic Lenses for making a 40 Power Pocket Microscope or 140 Power regular size Microscope. These color corrected Lenses will give you excellent definition and may be used for Micro-photography.
Stock #1037-Q.....$3.00 Postpaid

Consisting of Prism, Mirror and Condensing Lens. These used together with Stock #1037-Q will make an excellent Micro-projector enabling you to get screen magnification of 400 to 1000 Power according to screen distance.
Stock #1038-Q.....$2.00 Postpaid

MONOCULAR SET OF LENSES AND PRISMS . . . from Navy's 7 x 50 binocular. All the optics you need to make a 7 Power Monocular. Buy 2 sets to make a Binocular.
Stock #5100-Q . . . . . $5.00 Postpaid

38-PAGE DIRECTION BOOK "HOMEBUILT BINOCULARS" ..... 50c Postpaid

SPECIALS IN LENS SETS

Set #1-Q—"Our Advertising Special"—15 lenses for $1.60 Postpaid, plus 10-page idea booklet. For copying, ULTRA CLOSE-UP SHOTS, macrophotography, experimental optics, magnifying and for making a two power f/16 Telephoto Lens, "Dummy Camera," Kodachrome Viewer, DETACHABLE REFLEX VIEWFINDER for 35 mm. cameras steroscopic viewer, ground glass and enlarging focusing aids, TELESCOPES, low power Microscopes and for many other uses.

NEW 50-PAGE IDEA BOOK "FUN WITH CHIPPED EDGE LENSES"

Contains wide-variety of projects and fully covers the fascinating uses of all Lenses and in sets listed above . . . only $1.00 Postpaid.

SPECTROSCOPE SETS . . . These sets contain all Lenses and Prisms you need to make a Spectroscope plus FREE 15-page Instruction Booklet.
Stock #1500-Q Hand Type Spectroscope ..... $3.45 Postpaid
Stock #1501-Q Laboratory Type Spectroscope ..... $6.50 Postpaid

THICK FIRST SURFACE MIRROR—From Rangefinder—size 78 x 94 mms.—½" thick very flat optical glass. May have very slight scratch on chromium and aluminum coated surface. A $60.00 value.
Stock #533-Q.....$2.00 Postpaid

CLEANING BRUSH SET—12" flexible, plastic, hollow handle, circular construction. 4 brushes to set, range stiff to soft. Stock #504-Q (Reg. $6.00 value).....Price $1.00

RAW OPTICAL GLASS—An exceptional opportunity to secure a large variety of optical pieces, both Crown and Flint glass (seconds) in varying stages of processing. Many prism blanks.
Stock #703-Q 8 lbs. (Minimum weight) ..... $5.00 Postpaid
Stock #702-Q 1½ lbs.....$1.00 Postpaid

MAGNIFIER SET—5 magnifying Lenses—Powers from 1 to 10.
Stock #1026-Q ..... $2.00 Postpaid

RETICLE SET—5 assorted, engraved reticles from U. S. Gunsights.
Stock #2035-Q .....$1.00 Postpaid

ACHROMATIC LENSES

Stock No.	Dia. in mms.	F.L. in mms.	Price
6158-Q*	18	80	$1.00
6159-Q	23	51	1.25
6161-Q	24	48	1.25
6162-Q	25	122	1.25
6161-Q*	26	104	.80
6165-Q	27	185	1.00
6166-Q	29	54	1.25
6168-Q	29	76	1.25
6169-Q	31	122	1.50
6171-Q	32	171	1.00
6173-Q*	34	65	1.00
6176-Q*	38	131	1.00
6177-Q*	39	63	1.10
6178-Q*	45	189	1.50
6179-Q*	46	78	1.25

* ASTERISKED ITEMS are uncemented, but FREE cement and Directions included with uncemented sets.

USES—Use these Lenses for making Projecting Lenses, Low Power Microscope Objectives, corrected Magnifiers, substitute enlarging Lenses, Eye-Piece Lenses, Macrophotography, Gadgets, Optical Instruments, etc., etc.

LENS CLEANING TISSUE—One Ream—480 sheets. Size 7½" x 11". Stock #704-Q..$1.50 postpaid.

PRISMS: If you mount right angle Prism in front of Camera Lens and point camera straight ahead. you can take shot to left or right side without subject's knowledge. Technique successfully used by famous Press Photographers.

Stock No.	Type	Base Width	Base Length	Price
3040-Q	Right Angle	33 mms.	23 mms.	$ 1.00
3042-Q	Right Angle	41 mms.	40 mms.	1.00
3045-Q	Right Angle	70 mms.	168 mms.	8.00
3001-Q	Lens Surface	20 mms.	14 mms.	2.00
3006-Q	Porro-Abbe	9 mms.	9 mms.	.25
3009-Q	Porro	52 mms.	25 mms.	1.00
3010-Q	Porro	43 mms.	21 mms.	.50
3016-Q	Pentagon	45 mms.	22 mms.	.75
3029-Q	Dove	16 mms.	65 mms.	1.25
3036-Q	80 Degree Roof	60 mms.	36 mms.	4.00
6136-Q	Rhomboid	20 mms.	17 mms.	.50
3049-Q	Right Angle	69 mms.	167 mms.	10.00
3047-Q	Right Angle	53 mms.	103 mms.	4.00
3038-Q	Roof Prism	18 mms.	34 mms.	2.50

TANK PERISCOPE

Complete Set Mounted Components

Rugged, strong, originally constructed for U. S. Tank Corps. Consists of 2 fine Periscope Mirrors mounted in metal and plastic. Perfect condition. Only plywood body frame is required to finish this exceptional periscope. First surface mirror is well protected by glass windows. Set weighs 2¾ lbs. Overall length of mount 6⅛", width 2⅛". Would normally retail at $40 to $50.
Stock #700-Q $3 Complete Set Postpaid
TWO SETS (4 UNITS) SPECIAL ..... $5.50 Postpaid

ORDER BY SET OR STOCK NO. • SATISFACTION GUARANTEED • IMMEDIATE DELIVERY

EDMUND SALVAGE COMPANY, P. O. Audubon, New Jersey

ENGINEERING

Magnetron Tube

Mass production of the heart of radar assisted greatly in making sufficient modern radar to play its important role in war.

➤ THE STORY of how mass production of magnetron tubes, the heart of modern radar, was developed was told by officials of the Raytheon Manufacturing Company, said to be the largest maker of these tubes in the world. The mass production gave a sufficient supply of this essential part to permit the construction of enough radar equipment to meet the war needs both of America and England. Raytheon turned out, it is claimed, over half of all the magnetrons produced in the world.

The early magnetron was a British invention and was brought to this country to the government's Radiation Laboratory on the campus of the Massachusetts Institute of Technology in the summer of 1940. It was capable of generating microwaves of a power theretofore unknown. This English tube was very much improved by scientists at the laboratory, and various improved types, manufactured in America, became standard in all Allied radar equipment.

The magnetron is an oscillator, but magnetron oscillators differ from ordinary radio-frequency oscillators. It uses a magnetic field in conjunction with an electrostatic field to guide the electrons. Also the efficiency of the magnetron oscillator is very high at frequencies where the usual types of radio frequency oscillators refuse even to operate. For this reason magnetron tubes are not only the key to radar, but also to all ultra-high frequency radio designs.

Basically, the cavity magnetron, the type most commonly used, is made up of a heavy cylinder of copper around whose inner diameter a series of identical key holes have been cut with the narrow slot opening into the center hole. Each of the key holes represents a transmitter circuit. In the center of the body is placed an emitting cylinder, usually a nickel sleeve coated with an active material which upon heating produces a copious flow of electrons.

The electrical operation of the cavity magnetron can be best understood by remembering that the oscillators are placed cylindrically around the axis of the cathode, and a means of exciting these cavities must be provided. A magnetic field is applied axially to this diode, which causes the electrons emitted from the cathode to perform circular paths about the cathode. The electric motion can be thought of as an air stream passing a slot, which, when it acquires the correct velocity, causes the cavity to resonate.

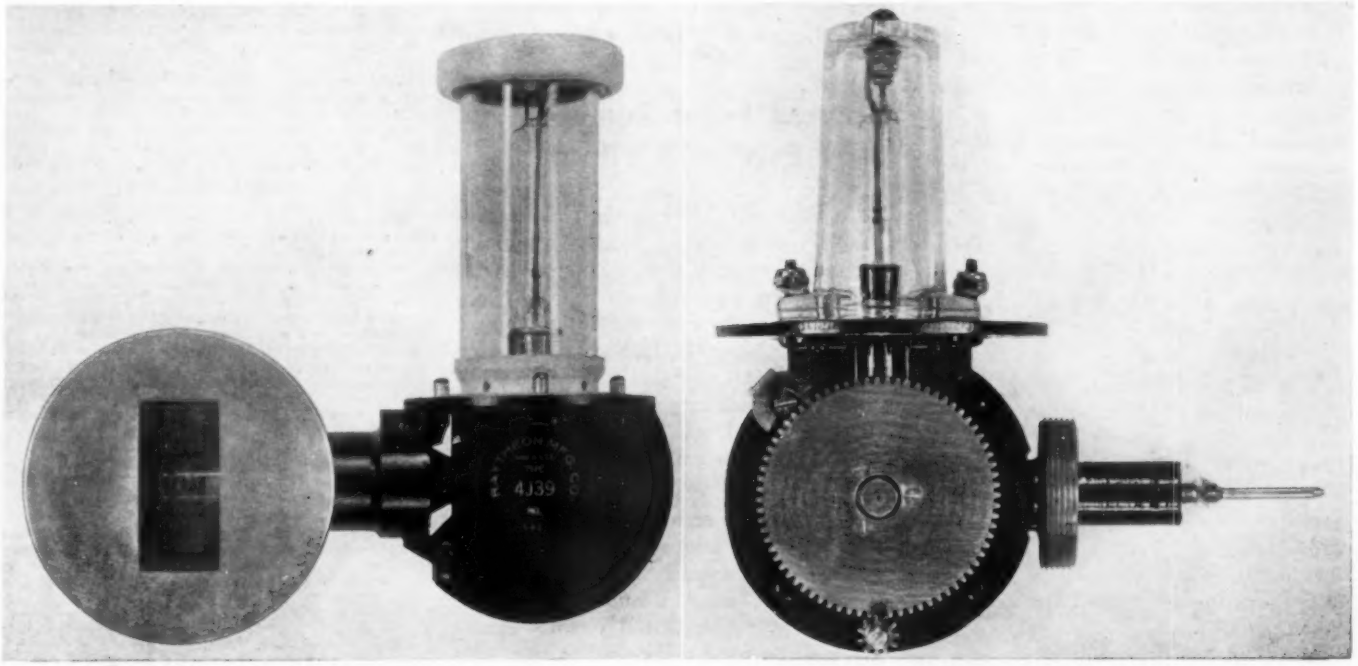
Science News Letter, December 29, 1945

AERONAUTICS-ORDNANCE

Radar-Guided Bat Bombs Blasted Jap Shipping

See Front Cover

➤ LAUNCHED by Navy Privateer patrol bombers outside the range of enemy anti-aircraft fire, and guided to distant targets by radar, Navy "Bat" bombs destroyed many tons of Jap shipping in the last year of the war. Operating on somewhat the same principle as live bats, which emit a short



HEART OF RADAR—The tube at the left is used primarily for high powered search and is a fixed frequency 12 cavity magnetron oscillator capable of delivering 1 megawatt peak power at 3500 megacycles. At the right, is type 2J54B tunable magnetron oscillator. This tube delivers 50 kilowatts peak power under pulsed conditions over a frequency range of 3120 to 3260 megacycles.

pulse of sound and direct themselves by echoes, robot "Bats" are guided by radar echoes. In the official U. S. Navy photograph on the front cover of this SCIENCE NEWS LETTER, a pulley device lifts the robot "Bat" to its launching position under the wing of the plane.

"Bats" were "briefed" on the target selected by the mother plane before being released. After their release, they were piloted by their own radar installation alone to hit the target—following the object despite the most extensive maneuvers.

Science News Letter, December 29, 1945

GEOLOGY

Productive Oil Field

Oklahoma pool is most important discovered since Pearl Harbor. By September of this year, it had produced nearly 25,000,000 barrels.

➤ DEFINITE faith on the part of the owner that there was oil in the area in spite of the lack of geological or geophysical evidence is responsible for the recent discovery of the West Edmond, Oklahoma, oil field, probably the most important oil pool found in the United States since Pearl Harbor. By September, 1945, the field had produced nearly 25,000,000 barrels.

The story of the opening of this field, Oklahoma's largest single oil field, is told in *Mining and Metallurgy*, (Dec.) journal of the American Institute of Mining and Metallurgical Engineers. It is told by E. G. Dahlgren of the Interstate Oil Compact Commission and Dan O. Howard, petroleum geologist of the Oklahoma Corporation Commission.

The area of the field is 26,800 acres, or over 41 square miles, and it is now equipped with 670 producing wells. One company estimates that there are some 600,000,000 barrels of oil in the ground, about one-third of which can be recovered by primary methods, leaving 400,000,000 barrels to be recovered by the various secondary methods of pressure maintenance, water-flooding, and re-pressuring.

The first well was started on Jan. 2, 1943, and on April 28 that year was flowing 522 barrels of light oil in 24 hours. Now, according to the report, the average initial production of the wells in the area is 1,200 barrels a day, with individual wells ranging in initial production from a minimum of 25 barrels to a maximum of 4,800 barrels each 24 hours.

When drilling of the first well was begun, it was planned to drill down to the Wilcox sand, estimated at about 7,350 feet but found at 7,670 feet. No oil was found in the Wilcox sand, however, but there had been a slight indication of oil when the well passed through the Hunton lime formation at a depth of 6,866 feet. It is in the Hunton lime that the oil exists.

"Seven-inch outside diameter casing was set at 7,301 feet through the Hunton lime," the authors state. "A cable-tool unit was moved on the location on March 31, 1943; the well bailed dry and perforated on April 5, 1943. Eleven holes were shot in the casing at from 6,951 to 6,856 feet, and the well started to head through the open casing. On April 28, after additional perforating, and after 2½-inch tubing had been run, the well flowed 522 barrels of oil in 24 hours."

Science News Letter, December 29, 1945

MEDICINE

Spotted Fever Remedy May Exist in B Vitamin

➤ A CHEMICAL remedy for dangerous, sometimes fatal Rocky Mountain spotted fever may exist in one of the B vitamins, para-aminobenzoic acid, it appears from a case reported by Drs. Harry M. Rose, Richard B. Duane and Edward E. Fischel of Columbia University College of Physicians and Surgeons and Presbyterian Hospital, New York (*Journal, American Medical Association*, Dec. 22).

Although a serum for treating the disease was developed a few years ago, no specific chemical remedy has heretofore been found. Results in one case do not prove that this B vitamin chemical is a remedy for the disease, the New York doctors point out, but they are suggestive.

A "precipitous" drop in the patient's temperature occurred when she was given this chemical, and her condition improved after the first 24 hours of treatment. She was entirely free of symptoms within 10 days.

Para-aminobenzoic acid had previously been found very effective in treating Rocky Mountain spotted fever in guinea pigs and it has been used with good results in typhus fever, which is also caused by germs of the rickettsia class.

Science News Letter, December 29, 1945

Rain water that falls in districts near the sea coasts usually contains appreciable quantities of chlorides.

SCIENCE NEWS LETTER

Vol. 48 **DECEMBER 29, 1945** *No. 26*

The weekly summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St. N. W., Washington 6, D. C. NOrth 2255. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years, $8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents. Monthly Overseas Edition: By first class mail to members of the U. S. Armed forces, $1.25 a year. To others outside continental U. S. and Canada by first class mail where letter postage is 3 cents, $1.25; where letter postage is 5 cents $1.50; by airmail, $1.00 plus 12 times the half-ounce airmail rates from U. S. to destination.

Copyright, 1945, by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service.

Entered as second class matter at the post office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature. Abridged Guide, and the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago, STAte 4439.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: **Edwin G. Conklin, American Philosophical Society; Otis W. Caldwell, Boyce Thompson Institute for Plant Research. *Nominated by the National Academy of Sciences:* Harlow Shapley, Harvard College Observatory; Warren H. Lewis, Wistar Institute; R. A. Millikan, California Institute of Technology. *Nominated by the National Research Council:* C. G. Abbot, Smithsonian Institution; Hugh S. Taylor, Princeton University; Ross G. Harrison, Yale University. *Nominated by the Journalistic Profession:* A. H. Birchhofer, Buffalo Evening News; Neil H. Swanson, Executive Editor, Sun Papers; O. W. Riegel, Washington and Lee School of Journalism. *Nominated by the E. W. Scripps Estate:* Max B. Cook, Scripps Howard Newspapers; H. L. Smithton, Executive Agent of E. W. Scripps Trust; Frank R. Ford, Evansville Press.**

Officers—President: **Harlow Shapley. *Vice President and Chairman of Executive Committee:* C. G. Abbot. *Treasurer:* Frank R. Ford. *Secretary:* Watson Davis.**

Staff—Director: **Watson Davis. *Writers:* Frank Thone, Jane Stafford, Marjorie Van de Water, A. C. Monahan, Martha G. Morrow. *Science Clubs of America:* Joseph H. Kraus, Margaret E. Patterson. *Photography:* Fremont Davis. *Sales and Advertising:* Hallie Jenkins. *Production:* Dorothy Reynolds.**

MEDICINE

Flu Vaccine Available

Is of the same type used by the Army this fall and winter, and is effective against Type B virus. If epidemic grows, demand may exceed supply.

➤ VACCINE against influenza Types A and B, the kind used to vaccinate all Army personnel this fall and winter, is now on the market for civilian use. This vaccine is effective against the Type B virus now causing outbreaks in various parts of the country, totalling some 150,000 reported cases during one week.

Replies to inquiries by telephone and telegram brought the following information: Eli Lilly and Company, the Lederle Laboratories and Pitman-Moore Company have the vaccine available now for civilian use. Pitman-Moore states all its branches are being supplied. Parke Davis will have its vaccine available to civilians before January. The Squibb vaccine will be available for civilian use about Feb. 15.

If the current epidemic grows and creates a sudden demand for large quantities of the vaccine, however, manufacturers may not be able to keep up with the demand. The vaccine cannot be produced overnight. Its production involves growing the influenza viruses on chick embryos and it takes from two to three months to get out a batch of vaccine.

When the manufacturers had supplied the Army's order, they slowed down or stopped production altogether because they had no idea whether there would be any civilian demand. The vaccine is barely out of the experimental stage, physicians were not expected to prescribe it for their patients unless an epidemic developed, and until the last week of November, no signs of an epidemic had appeared in official health reports. Consequently no company has a big supply of the vaccine on hand.

Lederle Laboratories, said to be the biggest producers of influenza vaccine, have enough on hand to vaccinate about 200,000, Dr. Herald R. Cox, associate director of research in charge of virus and rickettsial diseases, said. This company has started up production and will be making about 25,000 doses daily before Christmas, but it will be another month or two before they have any sizable quantities.

The vaccine must be given at least a week or 10 days before a person is exposed to influenza to allow time for immunity to the disease to be built up in the body. At first the dose was set at a single "shot" but this may be changed to two injections each of half the amount or of the full amount. A better immune response is always obtained, Dr. Cox explained, if the immunizing substance, or antigen, is divided into two or three doses. The first one acquaints the body with the new protein material and after that it is used to it and more readily accepts the substance and develops the proper response to it.

The protection given by the vaccine will last six months to a year, it is hoped. Actually scientists are not certain about this point because they have not had enough experience with it.

The 'vaccine was developed by Dr. Thomas Francis, Jr., and associates of the University of Michigan. It got its first major trial during the influenza epidemic of 1943-44 when controlled studies of it were made by the Army's Commission on Influenza on thousands of men in the Army Specialized Training Program units at eight different universities in different parts of the United States.

Results showed that the ratio of influenza in the unvaccinated to that in the vaccinated was four to one. So authorities expect the vaccine to protect about 75% of those vaccinated and to reduce the severity of the illness in the other 25%.

Science News Letter, December 29, 1945

MEDICINE

Blood Plasma Supply Stretched by Using Gelatin

➤ THE SUPPLY of blood plasma, probably dwindling since donors are no longer stimulated by war's urgency, may be stretched by substituting a gelatin solution in some cases, it appears from a report by Drs. T. H. Seldon, J. S. Lundy, R. C. Adams and E. N. Cook of the Mayo Clinic.

Its use without adverse effects in more than 400 cases, they report in the Proceedings of the Staff Meetings of the Mayo Clinic, was not as a source of protein for nourishment but solely as a plasma substitute to increase the blood volume.

Some of the patients had a little bleeding after operations but not enough to warrant transfusion of whole blood. Others had been given two to three pints of whole blood for shock or hemorrhage and needed more fluid in their veins but not necessarily blood or plasma. Elderly patients whose blood pressure tended to fall and other patients who needed supportive treatment after operations but not necessarily blood or plasma were also given the gelatin solution.

Science News Letter, December 29, 1945

CHEMISTRY

Naming New Elements Is Problem to Discoverer

➤ NAMING the two newest and heaviest chemical elements, numbers 95 and 96, is proving quite a problem to their discoverer, Dr. Glenn T. Seaborg of the University of California and the University of Chicago.

One difficulty is that the astronomers have not discovered any planets of the solar system beyond Pluto and therefore the newest transuranium elements cannot be named by following the system used in naming number 93, neptunium, named after planet Neptune, and number 94, plutonium, named after planet Pluto. Plutonium is one of the elements that can be used in making atomic bombs.

One possibility might be to rely on some property of the new elements in

DR. GLENN T. SEABORG

naming them, Dr. Seaborg said, speaking as guest of Watson Davis, director of Science Service, on the "Adventures in Science" radio program over the nationwide network of the Columbia Broadcasting System. Dr. Seaborg indicated that he might shortly name element 95, at least.

He has already received many suggestions for naming the new chemical babies.

Science News Letter, December 29, 1945

MEDICINE

Cleft Abdomen Baby Lives

Prompt operation in which silk stitches were used to pull together gradually the sides of the opening, saves life of baby boy.

➤ IN RICHMOND, Va., in July, 1942, a baby boy was born with the rare, usually fatal condition of cleft abdomen. His liver, gallbladder, stomach, colon and small intestines pushed through a five-inch wide opening that extended from the lower end of the breastbone to the navel.

Today, he is a normal three and a half year old child, one of the six babies recorded in medical history who have survived being born with this defect. His case was reported by Dr. Frank S. Johns, of the Johnston-Willis Hospital in Richmond, at the meeting of the Southern Surgical Association.

Prompt, efficient operation to repair the defect plus careful handling by the obstetrician, Dr. M. Pierce Rucker, when the baby was born, saved his life.

Dr. Rucker noticed the defect as the baby was born. He took care that the thin membrane covering the organs that pushed through the cleft was not broken. Compresses wet with salt solution were placed over the cleft abdomen and the baby was sent immediately to the surgical department.

Within a half hour after his birth, the baby was under ether and Dr. Johns was carefully pulling together with silk stitches the upper and lower ends of the cleft. He had first tried to force the liver, stomach and other organs gently back into what should have been their normal position.

At every such attempt, however, the baby would stop breathing. Finally, he put in the silk stitches and gradually pulled the sides of the opening together, leaving the unbroken membrane as a permanent overall covering. In the center, where the cleft had been almost five inches wide, a space about an inch wide was left open.

Adhesive strips were placed over the entire length of the wound, a dressing put on, and the baby returned to the nursery. The entire strapping was kept on for about six weeks or until there was complete granulation under it.

On the fifth day after the operation, the baby was put to the breast. He had previously been given lactose feedings and diluted breast milk as well as injections of normal salt solution and, later, of plasma from his father's blood.

When 13 days old he went home from the hospital, weighing six pounds five ounces, a satisfactory gain over his birth weight of five pounds eleven and three-fourths ounces.

The first known case of cleft abdomen was reported in 1557. Dr. Johns found reports of 87 cases altogether. Of these 58 were stillborn monstrosities. In 20 cases the baby was living at birth and normal except for the abdominal defect, but no attempt was made to repair it and these children all died. In nine, including the present case, attempts were made to repair the defect but only six of the babies survived.

The condition, which has the technical name of gastroschisis, is believed to be a structural abnormality and not one of growth. It originates in the embryo. If there is not enough liquor in which the embryo normally floats freely, or if the embryo or its sac is sticky, the embryo and the sac become united and that part of the embryo cannot develop normally.

This theory is believed to explain not only abdominal cleft but other abnormalities with which babies are sometimes born. Pressure from tumors in the mother's abdomen or deformities of the uterus are other possible causes of congenital abnormalities and monstrosities.

Science News Letter, December 29, 1945

Brazil nuts, shaped like segments of an orange, grow a dozen or more in a pod; this accounts for their shape.

LAST TRIP—The roadable autogiro, developed by the Pitcairn Autogiro Company ten years ago makes its last trip down North Capitol Street on its way to the Smithsonian Institution. CAA photograph.

BIOCHEMISTRY

Acid of 1080 Found in South African Plant

➤ NATURE ANTICIPATED man in manufacturing the stuff that makes the new super-ratbane, 1080, the deadliest thing that has yet hit the rodent world. Long before American chemists made a synthetic combination of sodium with fluoroacetic acid, which is the basis of 1080, a poisonous plant in South Africa was producing the same acid in its living tissues. Not only that, but the natives had found out that they could use the plant to poison rats.

The plant, which bears the Boer-Dutch name "gifblaar" (poison-blister), was analyzed for its poisonous principle by a South African scientist, Dr. J. S. C. Marais. He found that its toxicity was due to fluoroacetic acid, and suggested that this acid and its chemical relatives might be a source of valuable poisons and insecticides. American scientists, working under wartime pressure, made an independent discovery of the value of the same acid and its compounds without knowing of the previous work.

The botanical name of the poison-producing plant is *Dichapetalum cymosum.* It is a kind of second cousin to the euphorbias, most of which are also poisonous.

Science News Letter, December 29, 1945

ASTRONOMY

Mars Passes Saturn

On January 10 this planet will be only 59,463,000 miles away from the earth and will shine brilliantly in the constellation of Gemini, the twins.

By JAMES STOKLEY

➤ ALTHOUGH the Second World War is now happily over, the planet Mars, identified by ancient superstitions with the God of War, makes a visit to earth this month. It is not a particularly close one, but on Jan. 10 this planet will be a mere 59,463,000 miles away, and will shine brilliantly, as it does through the month, in the constellation of Gemini, the twins, high in the eastern evening sky.

Then Mars will be just south of the bright star Pollux, one of the twins, and south of Mars will appear another planet, Saturn. At the beginning of the month Mars will be to the east of Saturn but on Jan. 22 will pass his sluggish brother, as both planets are now moving in a westerly direction.

These planets are shown on the accompanying maps, along with the January evening stars, as they will be seen about 10:00 p. m. at the beginning of the month and at 8:00 p. m. on Jan. 31.

Just below and to the right of the triple group formed by Pollux, Saturn and Mars is the first magnitude star Procyon, in Canis Minor, the lesser dog. Still lower and farther to the right is Canis Major, the greater dog, with Sirius, the brightest star of the night sky. Of course Sirius is exceeded in brilliance by some of the planets, but they shine by reflected sunlight, not by their own luminosity as do the stars.

Many Stars

Above and to the right of Sirius is Orion, the warrior, one of the most conspicuous of all constellations, with the three stars in a row which form the belt. Above the belt is Betelgeuse and below is Rigel, both stars classed in the first magnitude. Continuing still farther to the right and upwards, we come to Taurus, the bull, with brilliant, ruddy Aldebaran to mark his eye. And when we continue northwards from Taurus we come next to Auriga, the charioteer, with another first magnitude star, Capella. Thus Pollux, Procyon, Sirius, Rigel, Aldebaran and Capella form a brilliant ring of stars, with Betelgeuse near the center and, at present, their grandeur augmented by the presence of Mars and Saturn.

Though there are other first-magnitude stars in the sky, they are not in a position to be seen at their best. There is Regulus, in Leo, the lion, low in the east; and Deneb, in Cygnus, the swan, low in the northwest. This rises higher later in the evening, and then another planet appears, for Jupiter, near Spica, in Virgo, the virgin, rises around midnight.

Mars Is Closer

Last year, even when the planet Mars was in the evening sky, it was hard to see because of its great distance as it stood on the farther side of the sun. But now earth and Mars are both in the same direction, and we make a close approach to each other, on Jan. 10. This approach occurs when Mars is almost at its greatest distance from the sun, and the earth nearly at its closest, so the two planets are much farther apart than they can be under the most favorable positions. In 1924, for instance, Mars was only about 35,000,000 miles away. These differences arise from the fact that the orbits of Mars and earth are not concentric circles, but ellipses. Just now the planets are in widely separated parts of their paths.

Close to Mars in the sky is the planet Saturn, which also is making an approach to the earth, although it is far beyond Mars. On Jan. 13 Saturn is closest, at a distance of 750,477,000 miles. Thus, like its brother, it is somewhat brighter than usual, and the two planets can now be watched in the midst of an interesting dance step.

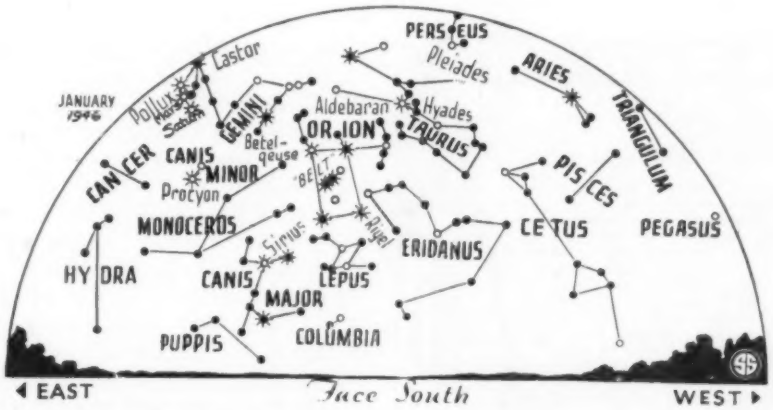
Planets Retrograde

The general motion of the planets through the sky from day to day is west to east, the same as for the sun and moon. However, at certain times of year, as the earth overtakes its brethren moving in larger orbits, they seem to retrograde, or to move from east to west. The effect is exactly the same as that observed when you are in an express train, and go by a freight. Even though the latter is going the same direction as you, it seems to be traveling the other way, because you are observing it from a moving platform.

Saturn "Stands Still"

Last Nov. 6 the earth and Saturn reached such a position that Saturn seemed to stand still in the sky, and then turn around for its retrograde movement. Mars did the same thing on Dec. 5. Thus, although Mars had passed Saturn, while both were moving easterly, on Oct. 26, they are now coming together again, and Mars will pass Saturn on Jan. 22. On Feb. 22 Mars turns around and resumes its easterly movement, while Saturn does the same on March 20. Just before that, however, on March 18, Mars will pass Saturn for the third time.

There is still another body that is close this month, for on Jan. 2 the earth will be at perihelion, when it is nearest the



☼ ✷ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Do You Know?

Aluminum clothespins may soon replace the familiar pin of wood.

Approximately 10,000 derivatives of *sugar* have been made by chemists.

Vitamin P is able to increase the concentration of calcium in the blood.

Onions in storage keep best in darkness and dryness, and in a temperature slightly above freezing.

The thickness of the *skull* ranges from less than one-eighth of an inch to almost half an inch.

If *castor bean* growing can be adapted to American mechanized farm harvesting, it can become a permanent and profitable crop in the United States.

Narcotic plants or stimulants have been used since ancient days for purposes of exhilaration, intoxication or in tribal ceremonies.

The American *potato* crop this year will be about 433,000,000 bushels; this is 15% above the average of the past 10 years, and the second largest crop ever grown.

Flax was the only outstanding important crop of 1945 in France; the production surpassed prewar averages, which means good news for French textile mills.

Sulfur played an important part in winning the war, during which over 15,000,000 tons were mined in the United States to supply all domestic needs and much of the needs of the Allies.

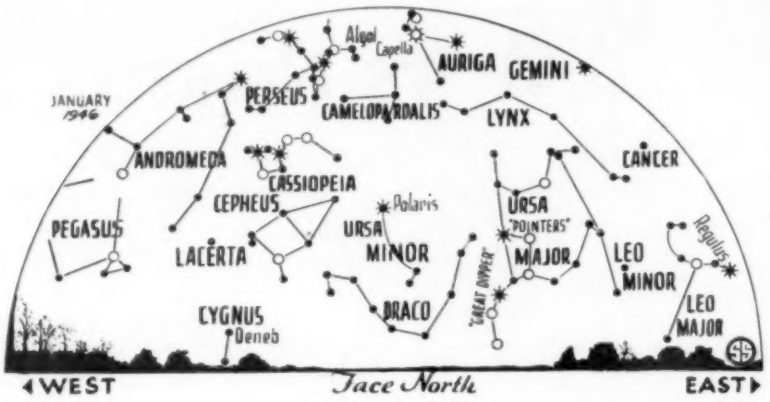
NEW "PICK-UP" CANE

Permits Disabled Persons To Pick Up Small Articles Without Painful Stooping.

NO OTHER CANE LIKE IT

The Mason "Pick-Up" is a light double purpose cane with concealed patented pick up mechanism that enables the user by simple finger pressure and without any stooping to easily pick up papers, pencils, cards, coins, etc. Proper balance and rubber grip tip insures safer walking. Use a beautifully finished Mason "Pick-Up" Cane yourself or as a perfect gift for a disabled service man or friend. Write today for FREE CIRCULAR and 5 DAYS TRIAL OFFER.

W. H. MASON Box 27, Leesburgh, Ohio



sun for the entire year. The distance then will be 91,455,000 miles, or about 3,000,000 miles closer than it will be in July. This is often a surprise to people who think we should be warmer when the sun is nearest. Actually, of course, it is the height of the sun in our sky that determines how much heat we get from it. Now, even at noon, it is so low that its rays are spread thinly over the ground. In July, by way of contrast, the noon-day sun comes well overhead, and its rays of light and heat, falling more nearly vertically, are much more concentrated.

Celestial Time Table for January

Jan.	EST	
2	1:00 p. m.	Sun nearest, distance 91,455,000 miles
3	7:30 a. m.	New moon Partial eclipse of sun, visible from South Pacific Ocean and Antarctica
10	2:00 a. m.	Mars nearest distance 59,463,000 miles
	3:27 p. m.	Moon in first quarter
12	1:00 a. m.	Saturn opposite sun
13	8:00 p. m.	Mars opposite sun
14	7:00 a. m.	Moon nearest, 227,540 miles
16	11:17 p. m.	Moon passes Saturn
17	2:02 a. m.	Moon passes Mars
	9:46 a. m.	Full moon
22	12:00 noon	Mars passes Saturn
24	5:47 a. m.	Moon passes Jupiter
	12:00 mdt.	Moon in last quarter
26	2:00 a. m.	Moon farthest, 251,320 miles

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, December 29, 1945

OPTICS

Optics Imitates Nature

➤ ONCE MORE science finds it profitable to imitate nature. The latest instance is the use of multiple lens systems similar to the eye of a fly to produce optical spectral patterns for comparison with the X-ray spectral patterns found in examination of the structure of crystals. When the spatial arrangement of the lens in the artificial fly's eye is similar to the projection of the crystal structure on a plane, the optical spectra have the same arrangement as the X-ray images.

An improved technique for constructing such "eyes" is described by Prof. W. L. Bragg and A. R. Stokes of the Cavendish Laboratory, Cambridge, (*Nature*). Previously, the grid of lenses had been made by using pinholes in a square array, with 40 pinholes to the centimeter. This produced fuzzy images and suffered from the further difficulty that the pinholes were liable to be blocked by specks of dust. The new method is to replace the pinholes by small lenses embossed on the surface of a sheet of transparent plastic and to cover the rest of the sheet with a paper mask. The minute lenses (0.06 centimeter in diameter, 0.5 centimeter in focal length) are produced by pressing a steel sphere into a soft copper block, and then casting or pressing the plastic on the block. The resulting images are sharper and more uniform in intensity than those given by the pinhole method.

The new method makes possible a rapid comparison of various geometrical arrangements for the structure of a given crystal. Previously, the determination of crystal structure from X-ray photographs required long and tedious calculations. Now a first approximation to the structure can quickly be obtained by a trial-and-error process of constructing a series of gratings with different geometrical arrangements. It should prove a valuable tool in speeding up routine X-ray determinations of crystal structure.

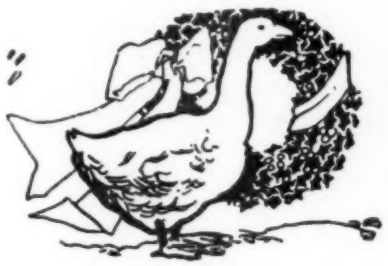
Science News Letter, December 29, 1945

Some *spiders* do not spin webs to catch their prey; they lie in ambush and pounce upon passing insects and grubs.

ETHNOLOGY

NATURE RAMBLINGS

by Frank Thone



Yuletide Goose

➤ TURKEYS were abundant in most markets this year, to meet the needs of Yuletide feasting. Tremendous numbers of them were killed and sold for Thanksgiving, only a month or so ago, yet the market display cases were again stacked high with dressed turkeys, and you could hear the gobblings of penned live birds wherever you went a-shopping.

Turkey for Christmas is pretty much an American institution. Our forebears in Europe, where the Christmas feast originated, feasted on goose—unless, indeed, they belonged to the wealthier nobility and could afford swan or peacock. But for the solid frankelyn and the substantial burgher, goose was the bird, as all accounts of Yule feastings, from Chaucer to Dickens, will well attest.

The goose meant more to our ancestors than the turkey does to us. The present-day American home gets turkey twice a year—at Thanksgiving and Christmas. For most modern small families a turkey is just too big; even the "streamlined" birds recently bred by Department of Agriculture scientists bulk a bit large on an apartment dinette table. Our forefathers and foremothers had bigger families, did more work out-of-doors, and lived in chillier dwellings, so they could use more meat—and fatter meat, too. They ate goose often; the Christmas goose was merely the biggest, best-favored bird in the flock, set apart for the special occasion.

Moreover, the usefulness of the goose was not finished when the last bit of meat had been picked from its bones. Usually there was a good deal of surplus fat, and this, carefully saved up in a jar, was used for choicer cooking, where something finer than lard was called for. Goose-grease with various home medicaments added also became a whole series of sovereign remedies. Even yet, many a balding elderly citizen can remember how he got goose-grease and turpentine rubbed on his chest for coughs and colds.

The goose also yielded fine down and small breast-feathers for the voluminous feather-beds in which our ancestors slept. (Literally in them, for you sink into a thick feather-bed until you think you are going to smother!) And not satisfied with that, our ancestors pulled another feather-bed over the top, in lieu of blankets or quilts. Country folk in Europe still sleep that way.

Finally, the stiff quills of wing and tail had their uses. Skillfully cut with pen-knives, they became pens—the only pens that were known for centuries. Trimmed otherwise, they winged the clothyard shafts that made the bowmen of England and Wales both famous and feared throughout Christendom and deep into Heathenesse. Thus the goose, despite its undeserved reputation for silliness, had its place in the tactics of war and at the council-table where treaties were signed.

Science News Letter, December 29, 1945

RADIO

Shoran Made Bombing Possible in Overcast

➤ A LITTLE-KNOWN radar navigational device called "Shoran" was used with remarkable success in bombing German targets through overcast in the last stages of the war in Europe and permitted bombing comparable with the accuracy of that in clear weather obtained with the famous Norden bombsight.

Shoran was one of the last radar systems applied tactically in Europe and was put into use only six months before the Nazi surrender. It was started, however, at Wright Field in 1939, in a search for an efficient short-range air navigation system. The Radio Corporation of America took up the problem, and the system is the result of cooperative work by Army electronic experts and scientists of RCA.

Ground stations are required for Shoran operation and a special airborne computer unit is essential. The system requires accurate maps and mathematics as well as suitable locations for the ground equipment. As its name implies, Shoran is short-ranged and is successful only if the range from ground station to target is not more than 250 miles, and if the computations on the airborne computer are carefully and accurately made.

For bombing operations, location of the bomb release point is accomplished by means of electrical waves instead of by optical bombsight. When used as a bombing device, a computer unit to determine distances, speed of approach, and bomb release point is added to the primary navigation equipment.

Science News Letter, December 29, 1945

Aluminum is very active chemically but tarnishes only slightly in air.

ERRATA, Vol. 48, Nos. 1-26, July-December, 1945

PAGE	TITLE BEGINS	CORRECTIONS
44	Boric Acid Treatment	Line 6, D *for* R.
48	Special Radio Receivers	Line 8, *after* batteries, *insert* or operate on.
130	Worm Is Both Father and Mother	Line 1, *to read,* live in river and lake bottom mud.
170	Precious Waste Products	By-line, Mooers *for* Moores.
172	Super-Rough-on-Rats	Par. 2, lines 3 and 4 *to read,* it was one in a series of toxic.
183	Nests with Awnings	Lt. Aldrich *for* Dr. Aldrich.
213	Attacks 1,000 Homes	Par. 2, lines 2-3, was comparable to *for* exceeded; lines 4-5, War *for* German blitz.
227	Carbon Dioxide for Polio	Par. 2, line 8, G. Peyton Kelley *for* G. Pelton Kelly.
272	Measurement Lamps	Photograph shows an U.H.F. truide transmitting tube.
309	Chemical War on Allergy	Par. 3, line 6, departure *for* department.
317	Simplest Engine	Line 3, *after* recently, *insert* during the meeting of the Soaring Society of America.
338	Arsenic Poison Remedy	Par. 8, line 4, benzylbenzoate *for* methylbenzoate.
341	Atom Bomb Nobelists	Col. 3, line 29, exclusion *for* exclusive.

FORECAST THE WEATHER

ACE WEATHER DIAL

Diameter 5⅜ inches

A scientific instrument that gives you a more accurate prediction from the reading of your own barometer.

Postpaid $1.00 in U. S. A.

W. H. REDDING

5105 Newhall St. Philadelphia 44, Pa.

• Books of the Week •

BALL AND ROLLER BEARING ENGINEERING—Arvid Palmgren—trans. by Gunnar Palmgren and Bruce Ruley—*SKF Industries*, 270 p., charts, illus., $1.75. Intended to serve as a fundamental text.

CLIMBING OUR FAMILY TREE: How Living Things Change and Develop—Alex Novikoff—*International Publishers*, 96 p., illus., $1.85. Evolution for boys and girls written by an instructor in biology at Brooklyn College.

CONTRIBUTIONS TO EMBRYOLOGY, Vol. 31, nos. 198-206, *Carnegie Institution of Wash.*, 176 p., charts, illus., $4.50 paper, $5 cloth.

A GUIDE TO COLLEGES, UNIVERSITIES, AND PROFESSIONAL SCHOOLS IN THE UNITED STATES—Carter V. Good, ed.—*American Council on Education*, 681 p., $5. Designed primarily for the guidance of veterans who wish to attend college under the GI Bill of Rights. Arranged in tabular form by both college and course.

PERSONALITY FACTORS IN COUNSELING—Charles A. Curren—*Grune & Stratton*, 287 p., charts, $4. Twenty phonographically recorded interviews.

PROCEEDINGS OF THE INDIANA ACADEMY OF SCIENCE FOR 1944—Vol. 54—R. C. Corley, ed.—*State Library, Indianapolis*, 233 p., illus., $3. Technical papers by members of the academy.

THE REFUGEES ARE NOW AMERICANS—Maurice R. Davie and Samuel Koenig—*Public Affairs Committee*, 32 p., illus., 10 cents. Based on a nation-wide study of the adjustment of refugees and their effect on our society, conducted by the Committee for the Study of Recent Immigration from Europe.

SAFE WORK PRACTICE IN WOODWORKING—G. Harold Silvius and Gerald B. Baysinger—*American Technical Society*, 82 p., illus., 85 cents. Safety education arranged according to tools and machines, with bibliography and index.

THE SCIENCE AND ART OF PERFUMERY—Edward Sagarin—*McGraw*, 268 p., illus., $3. Covers the history of perfumery, the raw materials of the perfumes and the methods of their production.

VALENCY: Classical and modern—W. G. Palmer—*Cambridge University Press*, 242 p., charts and illus., $2.50. Includes a history of valency, application of electronic theory to the heavier elements, and current developments.

Science News Letter, December 29, 1945

Photo courtesy Haverford College

RESISTANCE BOXES FOR STUDENT USE

L&N instruments like those shown above take long and hard use by physics students in their experiments. The resistance boxes are made in 2-, 3- and 4-dial instruments with enclosed switches, and can be used in d-c or low-frequency a-c measurements. D-C resistance change from zero setting, measured across binding posts, equals readings ±(0.1% + 0.01 ohm).

The Adjustable Mica Capacitor has a total capacitance of 1 μf in 5 sections: 0.5, 0.2, 0.2, 0.05, 0.05 μf. Limit of error is ±0.25%.

Further information on request.

LEEDS & NORTHRUP COMPANY, 4977 STENTON AVE., PHILA., PA.
LEEDS & NORTHRUP
Jrl Ad EB43(2b)

NUTRITION

Quick-Frozen Tomatoes Soon To Be on Market

➤ FROZEN tomatoes, whole, sliced, and as tomato juice, soon will be merchandised in the same manner as other frozen food products, John E. Nicholas, agricultural engineer of the Pennsylvania State College, predicted. He has stored satisfactorily all of these products in his laboratory.

For freezing, whole or in slices, tomatoes should not be too juicy, he pointed out. This year the early crops from both greenhouse and field proved best.

Both whole fruits and slices must be frozen very rapidly. Therefore they should not be wrapped until the freezing process is complete. Whole fruits require a temperature of 20 degrees below zero Fahrenheit or lower, but it is possible to freeze half-inch slices in direct contact with a freezer plate or air blast at 10 below. For good results, the tomatoes should freeze in 30 minutes or less. They may be placed on cellophane or a wire screen for ease in handling, Mr. Nicholas stated.

When completely frozen, the tomatoes or tomato products may be wrapped in cellophane, packaged in vapor-moisture-proof containers, or glazed by dipping in ice water. Whole tomatoes which have been frozen quickly and stored at below-zero temperatures will slice satisfactorily when partially thawed and will not break down if completely thawed out.

Tomato juice for freezing is prepared in the usual manner. It may be frozen in a large open tray and then broken into pieces of convenient size for packaging, or it may be frozen in glass jars or moisture-proof paper containers. It thaws enough for use if allowel to stand at room temperature for about an hour, Mr. Nicholas explained.

Science News Letter, December 29, 1945

AERONAUTICS

Engine Permits Speeds Over 500 Miles-an-Hour

➤ STREAMLINED like a torpedo, a new engine for jet-propulsion will speed planes well in excess of 500 miles an hour, it is claimed by General Electric, in whose factory in Schenectady the new powerplant was designed and constructed. It functions most efficiently when running at nearly full throttle, and is intended for speedy long-range flights.

The new motor is an axial flow turbojet engine. It was developed for the Army Air Forces, but is suitable for use in civilian planes. It marks definite improvements in aerodynamic design and in fuel consumption. It makes possible greater range and more economical operation of airplanes than earlier turbojet engines. Also, because of its torpedo-shaped body, it will fit more snugly into the wings of a plane than any powerful reciprocating engine.

The two principal parts of the engine, the air compressor and the combustion chamber, are directly in line. In operation, air rams into the relatively small diameter axial flow compressor, and, after compression, is forced almost in a direct line into combustion chambers. There fuel is added, usually kerosene. It burns intensely, creating the gases that expand through the buckets of a turbine and pass out the jet exhaust, giving the reaction push that drives the plane.

Science News Letter, December 29, 1945

GOLD

TRANSFER INITIALS

To identify your property. They can be easily applied to Metal, Wood, Glass, China, Leather or painted surfaces.

18 LETTERS ½" high $1.00

W. B. MacKENNEY
726 Commercial Trust Bldg., Philadelphia 2, Pa.

CHEMISTRY

New Nitric Oxide Process

Efficient, simple and inexpensive method developed in the laboratories of the University of Wisconsin. Will replace other production methods.

➤ NITRIC OXIDE, essential chemical in the manufacture of nitrate fertilizers and explosives, can now be made by an efficient, simple and inexpensive method developed in the chemical laboratories of the University of Wisconsin. It promises to replace the electric-arc and the German Haber methods of nitrate production, both of which are expensive and require extensive capital investments.

The new nitrogen fixation process was developed under the direction of Prof. Farrington Daniels from 1939 until 1944, then by William G. Hendrickson in Prof. Daniels' absence. The fundamental theoretic concept was proposed first by Dr. F. G. Cottrell of the Research Corporation. Patent applications have been made by the Wisconsin Alumni Research Foundation, a non-profit organization.

As is well known, air is made up principally of mixed but chemically uncombined nitrogen and oxygen. To combine them chemically to form nitric oxide, a temperature of 4,200 degrees Fahrenheit must be reached, and to make them stay combined the nitric oxide formed must be cooled almost instantaneously to at least 2,800 degrees.

In the electric-arc process, in which the extreme temperature is reached, air is passed through a high-voltage current leaping across the gap between two electrodes. In the Haber process, developed in Germany, ammonia is used as the go-between for the production of nitric oxide. Both processes are costly and for both extensive and expensive plants are required.

The new Wisconsin process appears deceptively simple. It consists of blowing large quantities of air through a hot bed of refractory pebbles to pre-heat the air, then through an extremely hot gas-fired furnace, and finally through a second pebble bed where the gas is chilled very rapidly and the heat is released and stored for use in pre-heating the incoming air when the flow is reversed.

"In effect, the plant is a two-way gas furnace," Mr. Hendrickson explains. "It was previously impossible to get this extremely high temperature because the flame temperature of fuel gases burning in ordinary air is much less than 4,200 degrees.

By pre-heating the air in a pebble bed, the flame temperature rose to 4,200 degrees, he said, "and at the same time two other objectives were accomplished—one bed of the furnace was cooled and the opposite one heated, so by periodically reversing the stream of air we could heat the nitrogen and oxygen to the temperature at which they would combine and almost immediately chill the resulting nitric oxide to prevent decomposition."

Science News Letter, December 29, 1945

PLANT PATHOLOGY

Pineapples Flower Full Year Ahead of Time

➤ PINEAPPLES have been induced to flower a full year ahead of their normal blossoming time by applications of growth-promoting chemicals, sometimes called synthetic hormones, in experiments at the Institute of Tropical Agriculture. Results are reported briefly by Dr. J. van Overbeek (*Science*, Dec. 14).

The chemical used in most of the experiments was naphthaleneacetic acid, called "NA" for convenience. Also used was 2,4-dichlorophenoxyacetic acid, which has recently received considerable public notice as a weed-killer under its convenience-designation, 2,4-D. In the pineapple-stimulating experiments, however, the concentrations were kept far below those used for weed eradication. The chemical was used in a dilution of five parts per million of water, and about a wineglassful of the solution applied to each plant. This concentration is only about one per cent as strong as that needed for killing weeds.

"The following conclusions," states Dr. van Overbeek, "may be drawn from these observations:

"One ounce of either NA or 2,4-D is a sufficient amount for inducing flowering in 113,000 plants, which is equivalent to a pineapple plantation of 11 acres.

"One dollar's worth of chemical (2,4-D, at the current price of $7.50 per kg) will treat over one-half million of plants (536,000), the equivalent of 53 acres of pineapples."

Science News Letter, December 29, 1945

The BURGESS vibro-tool for the LABORATORY

Reg. U. S. Pat. Off.

There are a multitude of jobs in almost every laboratory and research institution which the Vibro-Tool can perform so as to save time, money—and increase efficiency. The Vibro-Tool instantly marks names or identifying symbols on metals of all kinds (even hard steel), glass, wood, plastics and stone. Almost as easy as writing with a pencil. The Vibro-Tool is portable . . . easily moved from place to place . . . weighs slightly over one pound. Not tiring to the hand. No special experience needed to use it proficiently.

THE VIBRO-TOOL IS INDISPENSABLE ON THE PRODUCTION LINE . . . IDEAL FOR ALL TYPES OF CRAFT WORK.

More than three hundred Vibro-Tools are used in a single plant by inspectors, foremen, tool cribs and others, to speed work and add to efficiency. For the craftsman the Vibro-Tool is perfect for decorating, embossing, tooling, engraving on metals, wood, plastics, glass and leather. Comprehensive circular free on request.

The Vibro-Tool is obtainable from your laboratory supply house or, write direct to

60 CYCLE
110 VOLTS

Price $7.50. V-3 Needle for marking on steel and other hard materials $2.00.

With all attachments

$10.90

(HANDICRAFT DIVISION)
BURGESS BATTERY COMPANY
198 N. Wabash Avenue Chicago 1, Ill.

New Machines and Gadgets

❁ *TYPEWRITER type cleaner is a sheet of paper, to insert in the machine, which has a narrow strip of sticky material extending lengthwise along its center. With the ribbon either set at neutral or removed, the operator types in the usual manner. The type hits the sticky substance which removes the dirt.*

Science News Letter, December 29, 1945

❁ *BUILT-IN fire extinguishers on diesel locomotives will put out fires in the engine or along the right-of-way. By the operation of a single control, they will discharge either high-expansion mechanical foam for oil or gasoline fires, or plain water for fires in adjacent brush.*

Science News Letter, December 29, 1945

❁ *PLYWOOD splints were used by the Navy during the war for broken legs aboard ship because of their lightness and buoyancy in case the wearer was forced overboard in naval action. They were held in place by bandages instead of by straps as are conventional metal splits.*

Science News Letter, December 29, 1945

❁ *DIRECT-READING portable fluxmeters were developed during the war to give precise measurement of the field strengths of magnets used with magnetrons essential in radar and other electrical instruments. They consist principally of two special D'arsonval galvanometers and a delicate probe search coil.*

Science News Letter, December 29, 1945

❁ *PLUCKING machine removes feathers, even pinfeathers, from fowl at a rate of 200 chickens an hour. Essential parts of the machine are scores of rubber fingers mounted on a drum which turns at high speed. The picture shows a turkey being made ready for market.*

Science News Letter, December 29, 1945

❁ *EGG-CANDLING device is a small metal box within which an electric light is suspended in front of an adjustable reflector. Opposite the reflector is a lens to concentrate the light through a rubber-rimmed opening in which the egg is placed. The improved candler secures the maximum use of the light source.*

Science News Letter, December 29, 1945

❁ *PIE HOLDER, the shape and size of a piece of pie, prevents the delicacy from crushing in a lunch box. It consists of two similar trays of pie-thickness depth with one open side. Pivoted at their apexes in reversed position, when fitted together one forms a base, the other a cover, and all sides are protected.*

Science News Letter, December 29, 1945

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 290.*

Let us do it

When you want a book on science, save yourself the trouble of shopping. Let us get it for you. We will gladly obtain any American book or magazine in print and pay postage in the United States. Just send your check or money order to cover retail price ($5 if price is unknown, change to be returned to you). When publications are free, send 10c for handling. Address:

Book Department

SCIENCE NEWS LETTER
1719 N St., N.W., Washington 6, D.C.

Question Box

AERONAUTICS-ORDNANCE

How were "bat" bombs guided to their targets? p. 403.

ASTRONOMY

How close to earth will Mars be on Jan. 10? p. 407.

CHEMISTRY

How have pineapples been induced to flower a year ahead of time? p. 411.

What chemical may serve as a spotted fever remedy? p. 404.

What does the new nitric oxide process consist of? p. 411.

Where has the acid of 1080 been found produced by plants? p. 406.

ENGINEERING

What are magnetron tubes? p. 403.

GEOLOGY

Where is the most important oil field discovered since Pearl Harbor located? p. 404.

MEDICINE

How can the supply of blood plasma be increased? p. 405.

How was the life of the cleft abdomen baby saved? p. 406.

What flu vaccine is now available to the public? p. 405.

RADIO

How did Shoran help bombing? p. 409.

Where published sources are used they are cited.

The imprint to the right is mailing address for your Science News Letter.

Date on lower line is expiration of your subscription.

Renew early to avoid lapse in service.

In requesting change of address please give your old address as well as the new one, at least two weeks before change is to become effective.